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| APPLICATION NO.   | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|---|-------------|----------------------|---------------------|------------------|
| 09/761,753  | 01/18/2001  | Yukimasa Ishida      | 980307A             | 8695             |
| 38834   | 7590        | 03/09/2004           | EXAMINER            |                  |
| WESTERMAN, HATTORI, DANIELS & ADRIAN, LLP<br>1250 CONNECTICUT AVENUE, NW<br>SUITE 700<br>WASHINGTON, DC 20036 |             |                      | TOLEDO, FERNANDO L  |                  |
|   |             |                      | ART UNIT            | PAPER NUMBER     |
|   |             |                      | 2823                |                  |

DATE MAILED: 03/09/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

## Office Action Summary

Application No.

09/761,753

Applicant(s)

ISHIDA ET AL.

Examiner

Fernando L. Toledo

Art Unit

2823

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 18 February 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1,3-6,8,9 and 22-38 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 22-38 is/are allowed.
- 6) ☒ Claim(s) 1,3,5,6 and 8 is/are rejected.
- 7) ☒ Claim(s) 4 and 9 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 18 January 2001 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_.
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_.

## **DETAILED ACTION**

### ***Specification***

1. The title of the invention is not descriptive. A new title is required that is clearly indicative of the invention to which the claims are directed.

The following title is suggested: Process for Fabricating a Thin-Film Device Having Inclined Sides.

### ***Claim Rejections - 35 USC § 103***

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. Claims 1, 3, and 8 are rejected under 35 U.S.C. 103(a) as being unpatentable over Zhang et al. (U. S. patent 6,338,991 B1) in view of Noumi et al. (U. S. patent 5,915,172 A).

In re claims 1 and 3, Zhang in the U. S. patent 6,338,991 B1; figures 1A – 11D and related text, discloses forming a conducting layer 7 composed of an anodically oxidizable metal on a substrate; etching the conducting layer to form several of bus lines having upper surface parallel to the substrate and connection portion electrically connected to the bus lines and having upper surface parallel to the substrate; anodically oxidizing the bus lines and the connection

Art Unit: 2823

portion so that the bus lines and the connection portions include inner conducting portions and outer insulating oxide films covering the inner conducting portion respectively (Column 13).

Zhang does not show wherein the bus line and conducting portion's sides are inclined or outwardly protruding.

However, Noumi in the U. S. patent 5,915,172 A1; figures 1A – 6D and related text, discloses wherein the bus line and conducting portion's sides are inclined or outwardly protruding to improve the coatability of the etched films (Figure 4).

Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to form the bus lines and connection portions of Zhang with inclined or tapered sides or outwardly protruding because according to Naumi, the tapered or inclined sides of the bus lines and connection portion improve the coating of the etched films.

Zhang in view of Noumi does not disclose wherein the etching step is carried out so that the side surfaces of the bus lines and the side surfaces of the connection portions are inclined at angles within the range from  $20^{\circ}$  to  $60^{\circ}$  ( $30^{\circ}$  to  $50^{\circ}$ ) on average with respect to the substrate.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to have the inclined surfaces at angles within the range from  $20^{\circ}$  to  $60^{\circ}$  ( $30^{\circ}$  to  $50^{\circ}$ ), since it has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranges involves only routine skill in the art. *In re Aller*, 105 USPQ 233. In addition, the selection of angle of inclination, is obvious because it is a matter of determining optimum process conditions by routine experimentation with a limited number of species of result effective variables. These claims are prima facie obvious without

Art Unit: 2823

showing that the claimed ranges achieve unexpected results relative to the prior art range. In re Woodruff, 16 USPQ2d 1935, 1937 (Fed. Cir. 1990). See also In re Huang, 40 USPQ2d 1685, 1688 (Fed. Cir. 1996)(claimed ranges or a result effective variable, which do not overlap the prior art ranges, are unpatentable unless they produce a new and unexpected result which is different in kind and not merely in degree from the results of the prior art). See also In re Boesch, 205 USPQ 215 (CCPA) (discovery of optimum value of result effective variable in known process is ordinarily within skill or art) and In re Aller, 105 USPQ 233 (CCPA 1995) (selection of optimum ranges within prior art general conditions is obvious). Note that the specification contains no disclosure of either the critical nature of the claimed angles of inclination or any unexpected results arising therefrom. Where patentability is said to be based upon particular chosen angles of inclination or upon another variable recited in a claim, the Applicant must show that the chosen angles of inclination are critical. *In re Woodruff*, 919 F.2d 1575, 1578, 16 USPQ2d 1934, 1936 (Fed. Cir. 1990).

4. In re claim 8, Zhang in view of Noumi shows wherein the etching step is carried out so that the angles between the upper surfaces and the side surfaces of the bus lines and of the connection portion are obtuse angles (Figure 4 of Noumi).

5. Claims 5 and 6 is rejected under 35 U.S.C. 103(a) as being unpatentable over Zhang and Naumi as applied to claims 1 – 3 and 8 above, and further in view of Wolf and Tauber (Silicon Processing for the VLSI Era Volume 1: Process Technology, pp 452 – 453).

Art Unit: 2823

Zhang in view of Naumi do not teach wherein a resist mask is post-baked at a temperature of 115°C, prior to forming the gate electrodes.

However, Wolf and Tauber in the textbook “Silicon Processing for the VLSI Era Volume 1: Process Technology”, pp 452 – 453 discloses as conventional in the art to post bake a photoresist prior to etching the layers below at a temperature not lower than 130°C but not higher than 200°C.

Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to post-bake the photoresist of Zhang in view of Naumi prior to etching the gate electrodes to a temperature of 115°C as taught by Wolf and Tauber as it is the conventional way to prepare a photo resist prior to etching the layers below it. It would have been obvious to one having ordinary skill in the art at the time the invention was made to have a temperature of not lower than 130°C and not higher than 200°C, since it has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranges involves only routine skill in the art. *In re Aller*, 105 USPQ 233. Note that the specification contains no disclosure of either the critical nature of the claimed temperature range or any unexpected results arising therefrom. Where patentability is said to be based upon particular chosen temperature range or upon another variable recited in a claim, the Applicant must show that the chosen temperature range are critical. *In re Woodruff*, 919 F.2d 1575, 1578, 16 USPQ2d 1934, 1936 (Fed. Cir. 1990). In addition, the selection of post-bake temperature, is obvious because it is a matter of determining optimum process conditions by routine experimentation with a limited number of species of result effective variables. These claims are

Art Unit: 2823

prima facie obvious without showing that the claimed ranges achieve unexpected results relative to the prior art range. In re Woodruff, 16 USPQ2d 1935, 1937 (Fed. Cir. 1990). See also In re Huang, 40 USPQ2d 1685, 1688 (Fed. Cir. 1996)(claimed ranges or a result effective variable, which do not overlap the prior art ranges, are unpatentable unless they produce a new and unexpected result which is different in kind and not merely in degree from the results of the prior art). See also In re Boesch, 205 USPQ 215 (CCPA) (discovery of optimum value of result effective variable in known process is ordinarily within skill or art) and In re Aller, 105 USPQ 233 (CCPA 1995) (selection of optimum ranges within prior art general conditions is obvious).

#### ***Allowable Subject Matter***

6. Claims 22 – 38 are allowed over the prior art of record.
7. Claims 4 and 9 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

#### ***Response to Arguments***

8. Applicant's arguments filed 18 February 2004 have been fully considered but they are not persuasive for the following reasons.

Applicant contests the following:

The side surfaces of the present invention are inclined and outwardly protrude. As such, even if the references are combined, the combined teachings fail to teach all the features of the claimed invention.

Art Unit: 2823

Examiner respectfully submits that Zhang in view of Noumi disclose that the side surfaces are inclined and outwardly protrude as evidenced above and also on the Final Rejection mailed in 18 November 2003. Examiner agrees that neither Zhang nor Noumi disclose the degree of inclination but Applicant has neither showed that the degree of inclination is a critical step of the invention nor has argued in why the obviousness rejection is improper. Further, it would have been an obvious matter of design choice bounded by well known manufacturing constraints and ascertainable by routine experimentation and optimization to choose these particular angles of inclination because applicant has not disclosed that the angles of inclination are for a particular unobvious purpose, produce an unexpected result, or are otherwise critical, and it appears prima facie that the process would possess utility using another angle of inclination. Indeed, it has been held that mere dimensional limitations are prima facie obvious absent a disclosure that the limitations are for a particular unobvious purpose, produce an unexpected result, or are otherwise critical. See, for example, *In re Rose*, 220 F.2d 459, 105 USPQ 237 (CCPA 1955); *In re Rinehart*, 531 F.2d 1048, 189 USPQ 143 (CCPA 1976); *Gardner v. TEC Systems, Inc.*, 725 F.2d 1338, 220 USPQ 777 (Fed. Cir. 1984), cert. denied, 469 U.S. 830, 225 USPQ 232 (1984); *In re Dailey*, 357 F.2d 669, 149 USPQ 47 (CCPA 1966). See also MPEP 2144.04(IV)(B). Hence, the 35 U.S.C. § 103 rejection to claim 1 and pertaining dependent claims stands and is proper.



Art Unit: 2823

***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Fernando L. Toledo whose telephone number is 571-272-2187. The examiner can normally be reached on Mon-Fri 8am to 4pm.

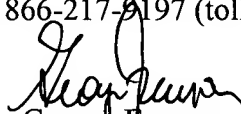
If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Olik Chaudhuri can be reached on 571-272-1855. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



FToledo

26 February 2004



George Fourson  
Primary Examiner  
Art Unit 2823